

## Claims

- [c1] (1) A system for analyzing a computer-generated design, said system comprising a computer, which operates under stored program control and which probabilistically analyzes the computer generated design.
- [c2] (2) The system of Claim 1 wherein said design may be used to create a performance surface and wherein said computer includes a controller which obtains samples of said performance surface and which uses said obtained samples to analyze said computer generated design.
- [c3] (3) The system of Claim 2 wherein said controller further determines whether said obtained samples adequately approximate said performance surface and wherein said controller obtains further samples based upon said determination.
- [c4] (4) The system of Claim 3 wherein said samples are obtained by the use of a modified Latin Hypercube methodology.
- [c5] (5) The system of Claim 4 wherein said controller further calculates a most probable point of operation.
- [c6] (6) The system of Claim 4 wherein said controller calculates a sensitivity of said most probable point.
- [c7] (7) A method for analyzing a computer generated model, said method including the steps of receiving the computer generated model; creating at least one variable; and probabilistically analyzing the computer generated model by the use of the at least one variable.
- [c8] (8) The method of Claim 7 wherein said method further requires the steps of sampling a performance surface by use of said at least one variable; and using said sampled performance space to probabilistically analyze said computer aided design.
- [c9] (9) The method of Claim 8 wherein said method further requires the steps of determining whether said sampled performance space adequately approximates said entire performance space.

- [c10] (10) The method of Claim 9 further comprising the step of creating a probability distribution value for said at least one variable.
- [c11] (11) The method of Claim 10 further comprising the step of using said probability distribution value to evaluate the influence of said at least one variable.
- [c12] (12) A method for analyzing a design, said method comprising the steps of:  
creating a performance surface;  
performing a random sampling of said created performance surface;  
performing an entropy analysis on said samples;  
performing a pair wise substitutions on said samples;  
based upon said entropy analysis and said pair wise substitutions, defining a certain portion of said performance space; and  
using said certain portion of said performance space to approximate said entire performance surface.
- [c13] (13) The method of Claim 12 further comprising the steps of determining whether said approximation is accurate; and based upon said determination, obtaining additional samples and using said obtained samples to refine said approximation.
- [c14] (14) The method of Claim 13 further comprising the step of defining a most probable point; and using said defined most probable point to perform a simulation.
- [c15] (15) The method of Claim 13 wherein said additional samples are made of non-linear parameters.
- [c16] (16) The method of Claim 14 wherein said simulation is performed by the combined use of MARS and Kriging methodologies.
- [c17] (17) The method of Claim 12 further comprising the step of creating a parameter diagram.
- [c18] (18) The method of Claim 13 wherein said performance surface is created by the

use of at least one variable, said method further comprising the step of analyzing the influence of at least one variable.

[c19] (19) The method of Claim 18 wherein said influence is dependent upon sensitivity and noise.